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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/808,598	03/25/2004	Johannes Jacobus Matheus Baselmans	081468-0308899	5600

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EXAMINER	
AKANBI, ISIAKA O	

ART UNIT	PAPER NUMBER
2877	

DATE MAILED: 01/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/808,598	BASELMANS ET AL.	
	Examiner	Art Unit	
	Isiaka O. Akanbi	2877	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *16 November 2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement file 14 September 2005 and 16 November 2005 has been entered and reference considered by the examiner.

Drawings

The examiner approves the drawings filed 25 March 2004.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 3, 9 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Kamon (6,245,470 B1). The reference of Kamon discloses the features of the claimed as follows:

As regard to claim 1, Kamon discloses a method of determining aberration of a projection system of a lithographic apparatus comprising of the following (fig.1)(col. 2, 24-28):

projecting a reference test pattern in the lithographic apparatus (fig. 3A);

projecting a second test pattern in the lithographic apparatus (fig. 3A);

measuring relative displacements along the best focus position between items in resulting images of said reference test pattern and said second test pattern (col. 6, line 40-47); and

determining information on the aberration of the projection system, using said measurements (col. 2, line 24-28),

wherein projecting the second test pattern comprises filtering to select particular radiation paths through the projection system (col. 5. line 28-38); and

wherein the measuring is performed for a plurality of images of the second test pattern obtained at planes displaced along an optical axis relative to each other (fig. 3A).

As to claim 2, according to claim 1, Kamon discloses a method calculating, for the plurality of images, a rate of change of displacement of portions of the second test pattern with respect to displacement along the optical axis (fig. 3A)(col. 6, line 40-47).

As to claim 3, Kamon discloses calculating a location in a pupil of the projection system (fig. 1) traversed by the (through which) radiation for particular portions of the second test pattern (32) using the calculated rate of change of the best focus (col. 6, line 40-47).

Regarding claims 9 and 10, Kamon discloses a device manufacturing method comprising projecting a patterned beam of radiation onto a target portion of a substrate, correcting for said aberration to reduce the aberration of the patterned beam projected onto the target portion of the substrate and a manufactured semiconductor device (col. 2, line 33-38).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 4, 5, 6, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamon (6,245,470 B1) in view of Taniguchi et al. (6,304,317 B1)

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over of Kamon in view of Taniguchi, as applied to claim 1. The reference of Kamon discloses of the features of claim 4, comprising pupil filter (13), however the reference of Kamon is silent regarding wherein coordinates of a filter used for the filtering are included as variable parameters in the calculations for determining the aberration information. The reference of Taniguchi teaches of a filter used for the filtering are included as variable parameters in the calculations for determining the aberration information (col. 35, line 2432). It would have been obvious to one having ordinary skill in the art at the time of invention to include filter used for the filtering as variable

parameters in the calculations for determining the aberration information for the purpose of accurate image-forming characteristic conditions.

As to claim 5, Kamon discloses pupil filter (13), however the reference of Kamon is silent regarding wherein spherical aberration introduced by a filter used for the filtering is included as a variable parameter in determining the aberration information. The reference of Taniguchi teaches of spherical aberration introduced by a filter used (col. 12, line 52-64)(col. 18, line 23-25). It would have been obvious to one having ordinary skill in the art at the time of invention to use a filter to introduced spherical aberration for the purpose of creating controllable spherical aberration, since these are well known filter used advantages. Further, It would have been obvious to one having ordinary skill in the art at the time of invention to include filter used for the filtering as variable parameters in the calculations for determining the aberration information for the purpose of accurate image-forming characteristic conditions.

As regard to claim 6, Kamon discloses a method of determining aberration of a projection system of a lithographic apparatus (fig.1)(col. 2, 24-28) comprising projecting a reference test pattern in the lithographic apparatus (fig. 3A), projecting a second test pattern in the lithographic apparatus (fig. 3A), measuring relative displacements along the best focus position between items in resulting images of said reference test pattern and said second test pattern (col. 6, line40-47), determining information on the aberration of the projection system, using said measurements (col. 2, line 24-28), wherein projecting the second test pattern comprises filtering to select particular radiation paths through the projection system (col. 5. line 28-38) and wherein the measuring is performed for a plurality of images of the second test pattern obtained at planes displaced along an optical axis relative to each other (fig. 3A). The reference of Kamon is silent regarding wherein coordinates of a filter used for the filtering are included as variable parameters in the calculations for determining the aberration information. The reference of Taniguchi teaches of a filter used for the filtering are included as variable parameters in the calculations for determining the aberration information (col. 35, line 2432). It would have been obvious to one having ordinary skill in the art at the time of invention to include filter used for the filtering as variable parameters in the calculations for determining the aberration information for the purpose of accurate image-forming characteristic conditions.

As regard to claim 7, Kamon discloses a method of determining aberration of a projection system of a lithographic apparatus (fig.1)(col. 2, 24-28) comprising projecting a reference test pattern in the lithographic apparatus (fig. 3A), projecting a second test pattern in

the lithographic apparatus (fig. 3A), measuring relative displacements along the best focus position between items in resulting images of said reference test pattern and said second test pattern (col. 6, line40-47), determining information on the aberration of the projection system, using said measurements (col. 2, line 24-28), wherein projecting the second test pattern comprises filtering to select particular radiation paths through the projection system (col. 5. line 28-38) and wherein the measuring is performed for a plurality of images of the second test pattern obtained at planes displaced along an optical axis relative to each other (fig. 3A). The reference of Kamon is silent regarding wherein spherical aberration introduced by a filter used for the filtering is included as a variable parameter in determining the aberration information. The reference of Taniguchi teaches of spherical aberration introduced by a filter used (col. 12, line 52-64)(col. 18, line 23-25). It would have been obvious to one having ordinary skill in the art at the time of invention to use a filter to introduced spherical aberration for the purpose of creating controllable spherical aberration, since these are well known filter used advantages. Further, It would have been obvious to one having ordinary skill in the art at the time of invention to include filter used for the filtering as variable parameters in the calculations for determining the aberration information for the purpose of accurate image-forming characteristic conditions.

As to claim 8, Kamon and Taniguchi discloses everything claimed, as applied to claim 7 above, in addition the spherical aberration is used to correct the measured displacements between portions of the resulting images of said reference test pattern and said second test pattern (col. 18, line 14-25).

Additional Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The references listed in the attached form PTO-892 teach of other prior art method of determining aberration of a projection system of a lithographic apparatus that may anticipate or obviate the claims of the applicant's invention.

Conclusion

Fax/Telephone Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Isiaka Akanbi whose telephone number is (571) 272-8658. The examiner can normally be reached on 8:00 a.m. - 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley Jr. can be reached on (571) 272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Isiaka Akanbi
December 14, 2005

Gregory J. Toatley, Jr.
Supervisory Patent Examiner
12Dec05